

REMARKS

In response to the Office Action mailed on August 26, 2003, Applicant wishes to enter the following remarks for the Examiner's consideration. Claim 1-44 are pending in the application. Applicant has amended claims 1, 8, 18, 20 and 27. Claims 3, 18-26 and claim 44 are currently withdrawn; however, the Examiner during interviews with him on September 22 and October 20, 2003 stated that claims 3 and 44 would be allowable if claims 1 and 34, respectively, were allowable. As claims 1 and 34 are considered to be allowable for the reasons given below for purposes of this response claims 3 and 44 are not considered to be withdrawn. Furthermore, the Examiner during an interview with him on October 20, 2003 stated that claims 18-26 would be considered if amended to depend from generic claim 1. As claim 1 is considered to be allowable for the reasons given below, for purposes of this response claims 18-26 are not considered to be withdrawn.

Election/Restriction

2. Claim 3 has been withdrawn from consideration pursuant to 37 CFR 1.142(b).

Claim 3 depends from independent claim 1, which the examiner has acknowledged to be a generic claim, covering both Fig. 1 and Fig. 8. For the purpose of a decision on the question of restriction the claims are ordinarily assumed to be in proper form and patentable over the prior art (MPEP 806.02). In a telephone conversation with Graham Eatwell on September 22nd, 2003, the examiner stated that claim 3 would be allowed if claim 1 were allowed. Applicant therefore submits that the withdrawal of claim 3 is improper and requests that claim 3 be reinstated and allowed.

Claim 18 contains the same elements as generic claim 1. The combination of claim 18 uses the sub-combination of the optical fiber and the optical power detector and so the invention claimed in claim 18 is not distinct from the invention in claim 1 (MPEP 806.05(c)). In order to emphasize this dependency, claim 18 has been amended to depend from claim 1. Claim 20 has been amended to retain consistency with amended claim 18. Applicant therefore submits that the restriction requirement and the withdrawal of claims 18-26 are improper. Reinstatement and allowance of claims 18-26 are requested at the examiner's earliest convenience.

3. Claim 44 has been withdrawn from consideration pursuant to 37 CFR 1.142(b). Claim 44 depends from independent 34, which the examiner has acknowledged to be a generic claim. Thus, the addition of claim 44 is not a claim directed to a "different invention" within the meaning of MPEP 821.03. Moreover, for the purpose of a decision on the question of restriction the claims are ordinarily assumed to be in proper form and patentable over the prior art (MPEP 806.02). Applicant therefore submits that the withdrawal of claim 44 is improper and requests that claim 44 be reinstated and allowed at the examiner's earliest convenience. In a telephone conversation with Graham Eatwell and Michelle Larson on October 20th, 2003, the examiner stated that claim 44 would be allowed if claim 34 were allowed.

4. Claims 3, 18-26 and 44 have been withdrawn from consideration pursuant to 37 CFR 1.142(b). The examiner has stated that claim 18 relates to Fig. 8 and has also stated that claims 1, 2, 4, 5 and 34 are generic to both Fig. 1 and Fig. 8. Applicant submits therefore that the invention of claims 3, 18-26 and 44 is not patentably distinct from the embodiment shown in Fig. 1 and so the withdrawal of the claims is

improper. Claims 18-26 have been amended to depend from generic claim 1. Reinstatement and allowance of claims 3, 18-26 and 44 are requested at the examiner's earliest convenience.

Specification

5. The specification has been amended as described above.

6. Rejection of claims under 35 USC §112, first paragraph

7. Claims 1-2, 4-17 and 27-43 have been rejected under 35 USC §112, first paragraph as failing to comply with the written description requirement. Applicant respectfully traverses this rejection of the claims.

Claims 1 and 27 have been amended to clarify that "the output" refers to "the output of the single optical power detector", and that the edge is detected when the output of the single optical power detector is less than its maximum value (when the light beam is not obstructed) and greater than its minimum value (when the object fully obstructs the light beam). Claim 8 has been amended similarly to clarify that "the level" refers to "the level of the optical power signal".

In claims 1 and 27, the output of the optical power detector is indicative of the optical power transmitted through the second optical fiber, i.e. the detector. The edge detector detects the position of an edge by detecting the optical power received by the second optical fiber. The relationship between the optical power and the edge position, when the edge partially obstructs the light beam, is described on page 6 lines 15-21 of the specification. The position of the edge within the beam may therefore be determined from the power (page 7, lines 11-14). For example,

half of the power is blocked when the edge of an opaque object is at the center of the beam (page 7, lines 18-20).

Referring to page 6 line13-15, the optical power at the detector when no object obstructs the light beam is denoted by P_{max} . Referring to page 9, lines 17-19, the value of the optical power when the object is fully within the beam is denoted by P_{min} . To detect an edge within a specified range of positions, the optical power lies within a corresponding range (page 10, lines 4-11). The condition $P(d_2) < P(d) < P(d_1)$, given on page 10, line 7, states that the optical power $P(d)$ is greater than $P(d_2)$ and less than $P(d_1)$. Since both of these positions are within the beam, $P(d_2)$ is greater than the optical power when the object is fully within the beam (P_{min}) and $P(d_1)$ is less than the optical power when the object is not within the beam (P_{max}). This is described more explicitly on page 9, lines 15-17, where the position of the edge is detected within the specified position range when the condition $P_{min} + \alpha(P_{max} - P_{min}) < P < P_{min} + \beta(P_{max} - P_{min})$ is satisfied. Since α is positive (page 9 lines 9-10) and $P_{max} > P_{min}$, the lower bound $P_{min} + \alpha(P_{max} - P_{min})$ is greater than the output of the single optical power detector when the object is fully within the light beam (P_{min}). Further, since β is less than unity (page 9 lines 9-10), the upper bound, $P_{min} + \beta(P_{max} - P_{min})$, is less than the output of the single optical power detector (P_{max}) when the object is not within the light beam object (Note, the upper bound may be rewritten as $P_{max} - (1 - \beta)(P_{max} - P_{min})$ and so it is less than P_{max} when $\beta < 1$).

In both of these examples the edge is detected in the specified range of positions when "the output of the single optical power detector is less than the maximum value P_{max} and greater than minimum value P_{min} ".

In light of the foregoing amendment and remarks, Applicant respectfully submits that the specification is supportive of claims 1, 2, 4-17 and 27-33 as filed

Docket No.: 10010838-1
Application No.: 09/935,018

and thus the inventor(s) had possession of the claimed invention. Applicant thus respectfully requests that this basis of rejection of the claims be withdrawn and that a Notice of Allowance for these claims be mailed at the Examiner's earliest convenience.

With respect to claims 34-43, claim 34 calls for "positioning the edge of the object within the light beam such that the second optical fiber is partially obscured and the optical power of the received light is greater than a lower threshold and less than an upper threshold". Page 9 lines 15-19, page 10 lines 4-11 and the flow chart shown in **FIG. 5** (together with the associated description on page 12, lines 2-17) disclose "positioning the edge of the object within the light beam such that the second optical fiber is partially obscured and the optical power of the received light is greater than a lower threshold and less than an upper threshold". In particular, page 12, lines 9-13 describe how "a correct fraction of the beam is being blocked by an object within the beam". If the optical power is greater than the minimum and less than the maximum, then the edge must be partially obscuring the light beam and a fraction of the light beam is being blocked. This is described again on page 6, lines 14-21. The relationship on page 6, line 18, upon which much of the remainder of the specification is based, describes the optical power at the detector when an object partially obstructs (obscures) the light beam.

In light of the foregoing amendment and remarks, Applicant respectfully submits that the specification is supportive of claims 34-43. Applicant thus respectfully requests that this basis of rejection of the claims be withdrawn and that a Notice of Allowance for these claims be mailed at the Examiner's earliest convenience.

8. Rejection of claims under 35 USC §112, second paragraph.

9. Claims 1-2, 4-17 and 27-33 have been rejected under 35 USC §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. Applicant respectfully traverses this rejection of the claims in light of the amendments to claims 1, 8 and 27.

Claims 1 and 27 have been amended to clarify that "the output" refers to "the output of the single optical power detector", and that the edge is detected when the output of the single optical power detector is less than its maximum value (when the light beam is not obstructed) and greater than its minimum value (when the object fully obstructs the light beam). Claim 8 has been amended similarly to clarify that "the level" refers to "the level of the optical power signal".

In light of the foregoing amendment and remarks, Applicant respectfully submits that claims 1-2, 4-17 and 27-33 particularly point out and distinctly claim the subject matter which the applicant regards as the invention. Applicant thus respectfully requests that this basis of rejection of the claims be withdrawn and that a Notice of Allowance for these claims be mailed at the Examiner's earliest convenience.

In light of the foregoing amendments and explanations, applicant submits that all rejections of claims 1, 2, 4-17 and 27-43 have been overcome. Furthermore, Applicant respectfully requests that the finality of the office action be withdrawn and requests reconsideration and allowance of claims 1-44 at the Examiner's earliest convenience. Although additional arguments could be made for the patentability of each of the claims, such arguments are believed unnecessary in view of the above

discussion. The undersigned wishes to make it clear that not making such arguments at this time should not be construed as a concession or admission to any statement in the Office Action.

Please contact the undersigned if you have any questions regarding this application.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Renee' Michelle Larson', with a long horizontal flourish extending to the right.

Renee' Michelle Larson
Larson & Associates, P.C.
Reg. No. 36,193
221 East Church Street
Frederick, Maryland 21701
301-668-3073
Attorney for Applicant(s)

October 22, 2003